Con. 5764 -13. **LJ-10577**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory.**
(2) Attempt any **four** questions from Q. **2** & Q. **7**.
(3) Make suitable assumption wherever necessary and clarly justify the same.

1. Answer **any four** of the following :- **20**
   (a) Explain why FM is immune to noise.
   (b) Explain how PPM is generated from PWM.
   (c) Explain tracking in AM receiver.
   (d) Why AGC (Control) is needed in receivers. Explain its working in brief.
   (e) What is aliasing error and how can it be eliminated ?

2. (a) With neat block diagram and wareforms explain working of adaptive delta mudulation. Explain its advantages. **10**
   (b) Explain with a neat block diagram and phasor diagram, working of phase discriminator. **10**

3. (a) Explain high power AM - DSBFC modulator with schematic diagram. **10**
   (b) Derive expression for mathametical representation of FM and its modulation index. **10**

4. (a) Draw block diagram and pulse code modulation technique and explain every block. **10**
   (b) Derive expression for total trasmitted power, total side band power and signal side band power for AM wave and draw frequency spectrum for DSBFC. **10**

5. (a) Draw block diagram of superhet receiver. Write frequency component present at the output of each block if modulating frequency is 1KHz, carrier frequency 535 KHz & IF 455 KHz also sketch waveforms of output & IF and detector stage. **10**
   (b) State and prove sampling theorum for low pass band limited signal. **10**

6. (a) Draw following data wave forms for bit stream 110101101 **8**
      (i) Bipolar RZ (ii) Bipolar RZ AMI
      (iii) Unipolar NRZ (iv) Bipolar NRZ
   (b) Draw and explain delta modulation transmitter and receiver. What is meant by slope overload distortion ? **12**

7. Write short notes on any **four** :- **20**
   (a) Preemphasis and deemphasis
   (b) Ratio detector
   (c) μ Law and A law of companding.
   (d) FM noise triangle.
   (e) Compare AM with FM.
